289 Vitamin D deficiency in patients attending the Tuscan regional cystic fibrosis centre

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Objectives: Blood levels of fat-soluble vitamins should be evaluated in CF patients (pts) and 25(OH)D serum values should be kept above the level of 30 ng/ml. The aim is to define 25(OH)D status of pts attending our Centre.

Methods: Pts attending our Centre were given fat-soluble vitamins according to published guidelines. 25(OH)D levels were analysed in 177 (94M, 83F) CF pts (mean±SD 17.9±12.5 years). The difference among pancreatic sufficient (PS) and insufficient (PI) pts was determined and serum levels in 3 age groups (<5 ys, 5–18 ys and adults) were compared. Serum 25(OH)D concentrations were reported by season winter/spring and summer/autumn.

25(OH)D mean serum concentration (MSC) was 26.7±12 ng/ml (26.2±12 ng/ml in 137 PI pts and 28.2±11.3 ng/ml in 40 PS pts $p = 0.3$). 79 (57.6%) out of 137 PI patients and 33 (82.5%) out of 40 PS pts had 25(OH)D <30 ng/ml. 25(OH)D MSC in the 3 age groups was respectively 31.3±10.1 ng/ml in 27 pts <5 ys, 26.9±11 ng/ml in 68 pts aged 5–18 ys and 25±13.4 ng/ml in adults. The difference between pts <5 ys vs adults was statistically significant ($p = 0.02$).

25(OH)D MSC was 30.9±10.8 in 88 pts tested in winter/spring and 22.4±11.7 in 89 pts tested in summer/autumn ($p < 0.05$). We observed no statistically significant associations between 25(OH)D levels and malnutrition (BMI < 18 in adults and <10º centile for BMI in pediatric age).

Conclusion: Despite supplementation, this data confirms levels of 25(OH)D below 30 ng/ml in many CF pts. 25(OH)D levels were lower in adults than children. Pts' compliance with vitamins supplements overtime should be carefully evaluated. Low levels were observed also in PS pts.

290 Relationship between serum 25-hydroxyvitamin D (25(OH)D) level and parathyroid hormone (PTH) level in adults with cystic fibrosis

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Objectives: To determine if adult CF patients achieve target serum 25(OH)D levels of 75–150 nmol/L. To test the hypothesis that patients with 25(OH)D levels <75 nmol/L have significantly higher serum PTH levels than those >75 nmol/L and explore whether there is a threshold for serum 25(OH)D, below which, serum PTH is >50 ng/L.

Methods: Blood samples were collected at routine out-patient visits. 129 consecutive patients were seen over 12 months. Patients who had undergone lung transplantation ($n = 21$) or were known to have other cause renal disease ($n = 0$) were excluded, leaving 108 eligible patients (55 men, 53 women). Mean age 27 [SD ±9.7] years and mean body mass index (BMI) 22.5 [±3.9] kg/m^2. Mean forced expiratory volume in one second (FEV_1) 60.9 [±26.3] % predicted. 90 (83%) patients had pancreatic insufficiency. 32 (30%) had CF related diabetes. 98 (91%) were prescribed cholecalciferol. 12 (11%) were osteoporotic and 68 (63%) were osteopaenic. 25(OH)D and PTH data were available for 98 patients (10 missing) and 62 patients (42 missing) respectively. Both 25(OH)D and PTH data were available for 57 patients.

Conclusion: Our results raise some doubt over the suggested relationship between serum 25(OH)D and serum PTH in adults with CF, particularly within the UK population. They cast uncertainty on the current vitamin D target guidelines in CF, as they have been set to manage PTH levels, and question whether they are appropriate and/or achievable in CF. Further research is required to thoroughly investigate the relationship between serum 25(OH)D and PTH levels in adults with CF and establish a sound scientific basis for an appropriate target serum 25(OH)D level.

291 Vitamin D status in children with cystic fibrosis

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Objectives: Vitamin (vit) D deficiency is common in CF population. CF Foundation Guidelines recommend dosage of 400 to 2000 IU daily in CF pediatric patients (pts) to obtain serum vit D levels ⩾75 nmol/mL. The main objective is to describe vit D levels of our pts and evaluate if low serum vit D level leads to dosage adjustment. The impact of additional vit D supplementation of 400 IU or 800 IU daily on vit D levels was also evaluated.

Methods: A retrospective descriptive study was conducted at CHU Ste-Justine CF clinic from 2007 to 2011. Vit D dosages varied between 0–1600 IU daily. Local reference values for vit D levels are: optimal (⩾75 nmol/L), low (27.5–75 nmol/L), deficiency (<27.5 nmol/L).

Conclusion: 196 pediatric pts, pancreatic sufficient (PS) ($N = 19$) and insufficient (PI) ($N = 177$) were included in the study. The most recent vit D levels are presented. 32% had optimal serum vit D levels, 66% had low levels and 2% a deficiency. 63% of pts received vit D 800 IU/day (39% with optimal levels), 16% received vit D 1200 IU/day (9% with optimal levels) and 3% received vit D 1600 IU/day (all had low levels). 84% PS pts had low levels. There was an average of 408 days between inadequate levels and dosage adjustment. Additional supplementation of 400 IU vit D daily resulted in a 5.7 nmol/L mean serum level increase. Additional 800 IU vit D daily resulted in a 10.9 nmol/L increase. Recent guidelines recommend vit D dosage up to 10000 IU/day in pts 10–18 years old. Vit D prescribed in our center is insufficient to reach optimal serum levels for a majority of pts. PS pts are also vit D deficient and need to be supplemented. This study allowed revision of our vit D supplementation protocol.

292 Vitamin blood levels after introducing multivitamin supplementation with AquADEKs® in cystic fibrosis children

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Background: In Norway, diverse combinations of vitamin preparations have been used to optimize vitamin status in cystic fibrosis (CF). From April 2011 AquADEKs® (high dose vitamins A, D, E, K in one formulation) has been available for prescription and the vitamin regime at the Oslo Paediatric CF-center was consecutively changed.

Aims: To assess the vitamin levels in CF children and to compare vitamin status before and after introducing AquADEKs®.

Methods: We collected data from our medical records including age, sex, the best FEV_1 and FVC registered during 12 months. Vitamin status was obtained (S-retinol, s-25OH$vitD_3$, s-alfa-tocopherol and p-PT-INR (a substitute for Vitamin K status)) before and minimum 3 months after introducing AquADEKs® (standard doses for age). 27 children (15 boys) were included and 2 subjects were pancreatic sufficient. We used paired t-test for the analyses of the mean differences in vitamin levels.

Results: Mean age was 9.2 years (1–18). Lung function was measured in 22 subjects with mean (CI) FEV_1 % predicted 96 (90, 103) and FVC % predicted: 99 (92, 105). Vitamin levels before and after introduction of AquADEKs® was [normal range in brackets]: S-retinol (μmol/l) mean (SD) (1.2 (0.3) versus (vs.) 1.3 (0.3) $p = 0.01$) [1.2–3.6], S-25OH$vitD_3$ (nmol/l) (69 (18) vs. 71 (19) $p = 0.50$) [37–131], S-alfa-tocopherol (μmol/l) (23.9 (10.1) vs. 25.8 (6.5) $p = 0.26$) [17.0–45.0], and P-INR (1.1 (0.1) vs. 1.1 (0.1) $p = 0.72$) [0.8–1.2].

Conclusions: Children with CF had acceptable mean values of fat-soluble vitamins. The use of AquADEKs® preparations significantly increased S-retinol and maintained levels of S-alfa-tocopherol, S-25OH$vitD_3$ and P-INR in CF children.